



OHIO DEPARTMENT OF AGRICULTURE GYPSY MOTH PROGRAM

Division of Plant Health, Plant Pest Control Section
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Gypsy Moth Damage To Trees

The impact Gypsy Moth will have on a particular forest stand depends on a) how much defoliation occurs in the stand, and b) how well the trees in the stand can tolerate that level of defoliation. The amount of defoliation a stand experiences depends on the gypsy moth population level in the area, the tree species composition, and on the number of larval hiding places. Gypsy moth population levels are usually estimated in terms of egg masses per acre. New egg mass numbers in excess of 250 per acre generally indicate that noticeable defoliation is imminent. Stands that contain a high proportion of preferred food species are more likely to be defoliated than those with more species variability. Stands that contain numerous larval hiding places, such as thick bark crevices, crooked trunks, wounds, and/or dead branch stubs, should support higher population levels, and hence, experience more defoliation.

Individual tree responses to defoliation will be affected by the amount of defoliation and the tree's condition. The amount of defoliation depends on the size of the gypsy moth population in the stand and on the tree species. Light defoliation will weaken but usually not kill a tree. Heavy (more than 50-60 percent) defoliation of broadleaf deciduous trees (such as oaks, maples, etc.) will often cause them to lose their remaining leaves and develop a second set of smaller, less efficient leaves. Weakened, less vigorous trees are more susceptible to secondary pests such as wood borers or root diseases. Repeated annual defoliation of broadleaf deciduous trees will ultimately result in the death of the tree.

In contrast, conifers (pines, spruce, fir, etc.) often die as a result of the initial heavy defoliation because they are unable to produce a second set of leaves. Stands containing low vigor trees and/or trees that have been stressed during the previous two or three years by such things as prior defoliation, drought, extensive timber harvesting, or other site disturbances will not tolerate defoliation as well as unstressed stands, and will usually sustain some mortality.

Most Preferred

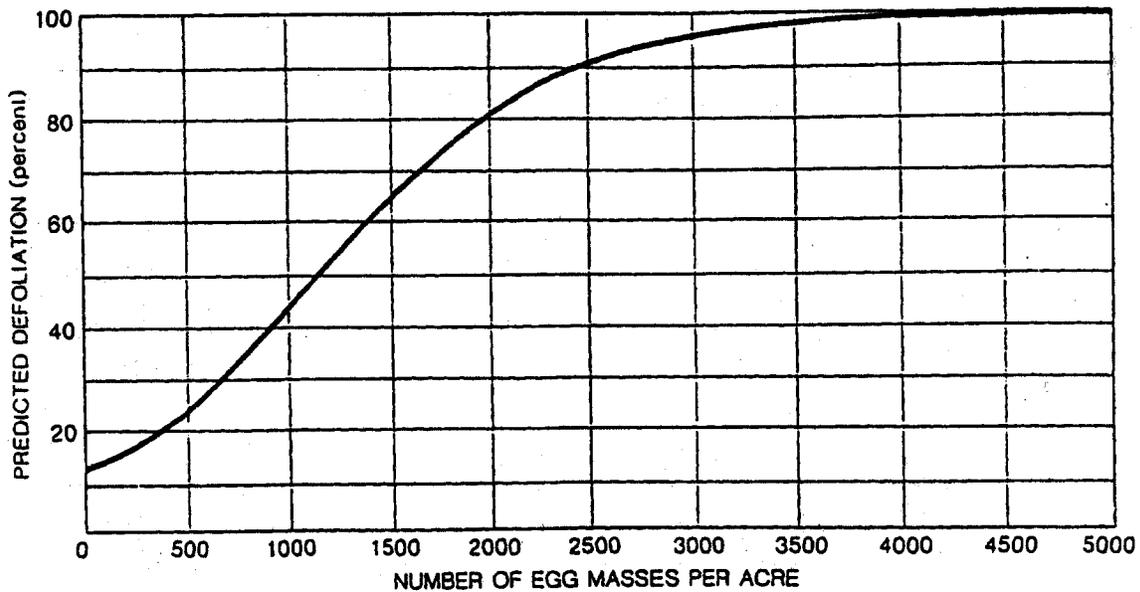
Alder
Apple
Aspen
Basswood
River Birch
Boxelder
Hawthorn
Larch
Mountain Ash
Oak
Sweetgum
Willow

Intermediate

A.Hornbeam
A.Beech
Black Gum
Buckeye
Sweet Birch
Cherry
Chestnut
Cottonwood
Cucumber tree
Dogwood
Elm
E.Hophornbeam
Hickory
Magnolia
Maple
Persimmon
Pine
Redbud
Sassafrass
Serviceberry
Sourwood
Walnut

Less Preferred

Arborvitae
Ash
Catalpa
E.Red Cedar
Fir
Grape
Holly
Honey Locust
Horsechestnut
Black Locust
Mulberry
Spruce
Sycamore
Tulip tree



A graph for predicting gypsy moth defoliation (Gansner et al 1985).

Light Defoliation 1 – 30%; Moderate Defoliation 31 – 60%; Heavy Defoliation 61 – 100%

One of the requirements for inclusion into the Ohio Department of Agriculture’s Gypsy Moth Suppression Program is 250 egg masses per acre in a residential area and 1,000 egg masses per acre in a forested area. Suppression treatments at 250 and 1000 egg masses per acre were determined to suppress gypsy moth populations, prevent defoliation and minimize the associated impacts.

Results Of A Ten Year Study To Determine Tree Mortality Following Heavy Defoliation In Pennsylvania

	Average Oak Mortality	Average Mortality All Tree Species
Following 1 year heavy defoliation	18%	14%
Following 2 year heavy defoliation	89%	38%
Following 3 year heavy defoliation	98%	48%

Source: Division of Forest Pest Management, Pennsylvania